

# Systematic Services Analysis and Improvement for Supermarket

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## Abstract

Achieving satisfactory service is crucial to supermarket management, but past studies of service quality mainly focused on discovering the quality elements contributing to customer care, and did not focus on proposing improvements and suggestions. This study primarily focused on the service quality of a medium-sized chain supermarket by surveying quality needs, exploring quality problems, and proposing an improvement program. Effectively combining customer needs to revise the method of service quality improvement, this study comprises three parts: demand survey, demand analysis and conversion. The demand survey is based on the SERVQUAL model of PZB to establish a customer demand questionnaire for a medium-sized chain supermarket. The demand analysis used the two-dimensional quality element classification table to classify the quality factors. Furthermore, the demand conversion used quality function deployment (QFD) to convert into effective practice improvement.

## Keywords

*Supermarket; Service Quality; Kano Model; Quality Function Deployment*

## Introduction

With continued global economic development, average household income is steadily increasing, enhancing numbers of potential consumers and purchasing power in many countries. In Taiwan, this trend is driving increased turnover of general merchandise retail supermarkets. Owing to changing habits, people are increasingly doing their shopping in supermarkets rather than expensive convenience stores or discount stores that require large volume purchases.

Past studies of supermarkets have focused on analyzing business strategy and competitive advantage, and have also explored experiential marketing and sports marketing. The study of service quality mostly focuses on comparative cognition and

the gap between expectations and measured results in relation to service quality, and uses the five dimensions of the SERVQUAL model (reliability, responsiveness, credibility, empathy and tangibles) (PZB 1988). The Retail Service Quality Scale (RSQS) is another method of assessing retail quality (Dabholka et al. 1996). The RSQS Scale includes five dimensions (physical image, reliability, problem solving, store policies, personnel interaction) and 28 question items, and uses qualitative research to measure service quality, by recording consumer behavior, as well as observation and in depth interviews.

Offering satisfactory service quality is a crucial aspect of supermarket management, but past service quality studies focused on identifying the quality elements of customer care rather than improvement countermeasures and suggestions. This study primarily focused on the service quality of medium-sized chain supermarkets conducting quality needs surveys and exploring quality to propose improvement programs. The SERVQUAL and RSQS models can be combined with the demand survey on customer's service quality when shopping in a supermarket. The Kano two-dimensional quality model is applied to the survey result and customer demands regarding service quality are classified. Attractive and essential qualities are then identified, and become key service quality elements. Regarding these key quality elements, the quality function deployment is used to advise supermarkets and implement improvement action plans. Using the quality function deployment in this way can strengthen supermarket competitiveness and provide future entrants to the industry with a reference.

## Research Framework

This study focuses on reviewing the related literature,

gathering data, and analyzing the current operation of supermarket. The main objective of the supermarket service demand survey is to gather information on the supermarket service and management literature and design a questionnaire to investigate supermarket service requirement. This study collects customer requirements and opinions and transfers them to customer demand items for supermarket service quality to identify a positive improvement scheme and new development direction for designing a creative service. Figure 1 shows the research structure.

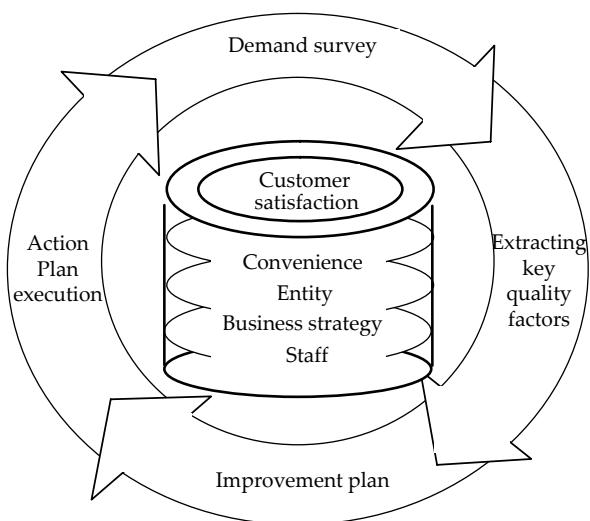


FIG. 1 RESEARCH STRUCTURE

Effectively combining customer needs to revise the method of service quality improvement, this study comprises three stages, as shown in Fig. 2, namely the demand survey stage, demand analysis stage and demand conversion stage.

First, the demand survey stage aims to precisely identify the target demand. This study focused on the target customer needs of a medium-sized chain supermarket, and uses the SERVQUAL model to establish a questionnaire for clarifying customer demand.

The second stage comprises demand analysis, which identifies all the service items that concern the customer and can be improved. This study used the two-dimensional quality element classification table of Schvaneveldt et al. (1991), and classified the results of each questionnaire item. After collecting the completed questionnaires, this study took the mode as a way of selecting quality factors, and determined the service element quality. The two-dimensional quality was published by Kano et al. in 1984 (Yang et al. 2011).

Kano et al. (1984) proposed that customer demand quality is based on customer satisfaction and the degree to which quality attributes are achieved, and further classified quality elements as attractive, one-dimensional, essential, indifferent and undesirable, thus measuring customer perceptions of service quality. Attractive qualities are attributes that provide satisfaction when fully achieved, but do not cause dissatisfaction when not fulfilled. One-dimensional qualities result in satisfaction when fulfilled and fulfillment to higher levels further increases customer satisfaction. Such attributes result in dissatisfaction when not fulfilled and customers become dissatisfied when they are fulfilled to lower levels. Essential qualities are attributes that are taken for granted when fulfilled but cause dissatisfaction when not fulfilled. Indifferent qualities do not influence customer satisfaction or dissatisfaction. Undesirable qualities are attributes that cause customer dissatisfaction when fulfilled and satisfaction when not fulfilled.

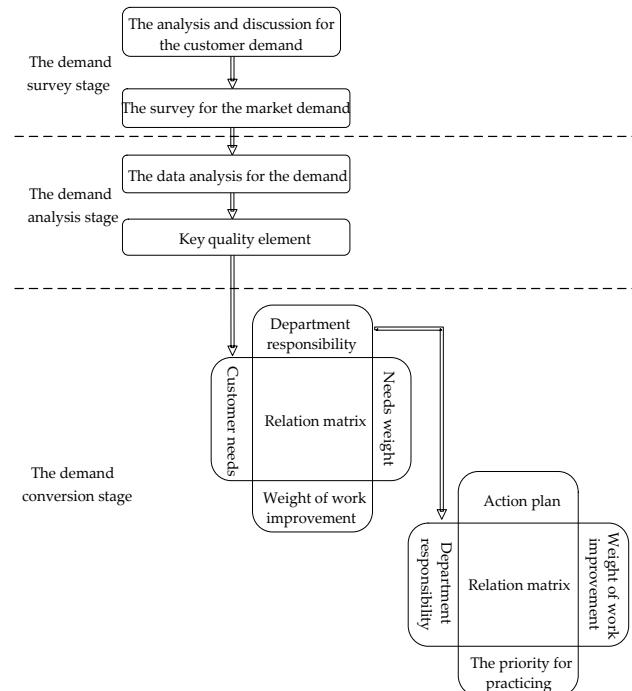


FIG. 2 RESEARCH PROCESS

The third stage involves the demand for the conversion which takes customer needs as the starting point for quality function deployment, and which converts QFD into effective practice improvement. QFD is based on customer needs and developed into a series of process re-engineering and integration services, to achieve customer requests for a comprehensive tool for service quality control. QFD is applied to the departmental responsibility and used to

design action plans, perform flow transformation work and so on, to maintain and enhance business competitiveness (Aytac and Deniz 2005; Büyüközkan et al. 2007; Ding 2009; Dror and Sukenik 2011; Liu 2010; Yang et al. 2006).

### Demand Survey and Quality Classified

The questionnaire design was based on the dimension of PZB service quality model, and the questionnaire was organized to make it suitable for assessing the service quality of a medium-sized chain supermarket.

The service quality questionnaire comprises four dimensions: convenience, entities (external environment, internal environment, and goods), business strategy (brand image and promotion), and staff (problem solving and efficiency). These four main dimensions were further classified into seven sub-dimensions and 37 service quality factors. Further explanation is presented below:

- Convenience: The necessary conditions, that customers are willing to store, totaling five quality factors.
- Entity - external environment: Facilities external to the store but controlled by the store, totaling four quality factors.
- Entity - internal environment: Facilities within the store and controlled by the store], totaling seven quality factors.
- Entity - goods: The service related to commodity, totaling four quality factors.
- Business strategy - brand image: The image created by the store and its advertising, totaling two quality factors.
- Business strategy - promotion: Marketing approach, totaling two quality factors.
- Staff - problem solving: The ability of staff to respond to unexpected situations, totaling six quality factors.
- Staff - efficiency: The performance of staff in facing routine standard procedures, totaling seven quality factors.

This study distributed 389 questionnaires and received 328 valid responses, representing a response rate of 84%, with females comprising the majority of respondents (60.37%). In terms of age, respondents were mostly between 21 and 59 years (85.97%).

Regarding profession, the largest group of respondents (35.64%) were employed in services and commerce. Regarding monthly family income, the largest group of respondents (35.37%) had incomes ranging between NTD 30,000 and 60,000.

Following questionnaire completion and recovery, this study seeks to clarify customer preferences and buying modes. The two-dimensional quality inquiry is intended to investigate the level of care exhibited by customers in relation to each service quality. In the quality factor classification part, as presented by Schvaneveldt et al. (1991) in their survey of quality attributes, all attributes are positive and thus no undesirable qualities exist. This study used the two-dimensional quality element classification table of Schvaneveldt et al. (1991) (Table 1) to classify the results of each questionnaire item. After collecting the entire questionnaire, the study used the mode to select quality factors, and determine service element quality (Table 2).

TABLE 1 TWO-DIMENSIONAL QUALITY ELEMENT CLASSIFICATION

<i>Have not Have</i>	Satisfied	Somewhat Satisfied	Neither Satisfied nor Unsatisfied	Somewhat Unsatisfied	Unsatisfied
Satisfied	Others quality	Attractive quality	Attractive quality	Attractive quality	One-dimensional quality
Somewhat Satisfied	Others quality	Indifferent quality	Indifferent quality	Indifferent quality	Must-be quality
Neither Satisfied nor Unsatisfied	Others quality	Indifferent quality	Indifferent quality	Indifferent quality	Must-be quality
Somewhat Unsatisfied	Others quality	Indifferent quality	Indifferent quality	Indifferent quality	Must-be quality
Unsatisfied	Reverse quality	Others quality	Others quality	Others quality	Others quality

The classification results are as follows: 21 qualities are identified as attractive, eight as one-dimensional, three as indifferent, and none as essential, undesirable or other. Thus there are 21 attractive and essential qualities. This study thus converts the follow-up service plan.

TABLE 2 TWO-DIMENSIONAL QUALITY OF CLASSIFICATION RESULTS

Dimension	Sub-dimension	Each item content from questionnaire	Attractive (%)	One-dimensional 1 (%)	Must-be (%)	Indifferent (%)	Reverse (%)	Others (%)	Property classification
convenience		The address of the supermarket store is easy to reach.	53.35	11.89	1.52	20.73	0.00	12.50	Attractive
		The supermarket meets the needs of a variety of goods at a time.	61.89	13.11	2.74	21.04	0.00	1.22	Attractive
		There are variety brands to a single product for choose.	43.60	19.21	6.71	29.27	0.00	1.22	Attractive
Entity	External environment	The outside of supermarket is clean, goods placed neatly.	55.79	18.60	3.66	20.12	0.00	1.83	Attractive
		There is car and motorbike parking for temporary.	32.32	25.00	4.57	31.40	0.61	6.10	Attractive
	Internal environment	Smooth entrance to the supermarket.	42.07	28.66	6.10	21.95	0.00	1.22	Attractive
		Store environment is clean and tidy.	35.37	40.55	6.40	15.55	0.30	1.83	One-dimensional
		Spacious store aisle.	55.49	11.89	2.13	23.17	0.00	7.32	Attractive
		Shopping carts and baskets maintain well.	39.33	24.39	3.05	32.62	0.00	0.61	Attractive
		Set goods signs, can help me find required goods rapidly.	36.28	42.07	3.05	16.46	0.00	2.13	One-dimensional
	Goods	Clear classification of goods placed	37.50	42.38	3.35	16.46	0.00	0.30	One-dimensional
		I can see the selling price nameplate of goods clearly.	32.32	40.55	5.18	10.06	0.00	11.89	One-dimensional
		The supermarket selling high quality goods.	25.00	58.54	7.93	8.23	0.00	0.30	One-dimensional
		The nameplates are provided a complete description of goods information clearly.	40.85	27.13	2.13	26.22	0.00	3.66	Attractive
		The selling price is cheaper than others.	64.94	11.28	0.91	16.46	0.00	6.40	Attractive
		I can get the latest listing of goods from supermarket.	49.09	15.55	1.22	29.88	0.30	3.96	Attractive
Business strategy	Brand image	The real goods price is fully consistent with the DM.	27.44	48.78	7.32	15.24	0.61	0.61	One-dimensional
		Special promotion or product with festival.	43.90	21.65	3.05	25.00	0.00	6.40	Attractive
	Promotion	The supermarket is providing membership card bonus set of points.	36.89	8.54	1.83	52.13	0.00	0.61	Indifferent
		The supermarket is providing membership card could store cash value	27.74	5.18	0.91	65.85	0.00	0.30	Indifferent
Staff	Efficiency	Staff attitude are enthusiastic.	24.39	57.62	4.88	12.50	0.00	0.61	One-dimensional
		When consumption in supermarket, staff provide promotion activity timely.	21.34	11.28	3.35	58.23	0.61	5.18	Indifferent
		Staff could answer immediately when customer asked the location of goods and store information and activities.	57.93	20.43	2.44	18.90	0.00	0.30	Attractive
		Staff will take the initiative to offer customer promote information when checkout.	41.16	27.44	1.22	29.57	0.00	0.61	Attractive
		There are no expired goods on supermarket shelves.	42.68	37.80	6.71	9.76	0.00	3.05	Attractive
		The goods checked carefully before added to the shelves.	54.88	20.43	1.83	19.82	0.00	3.05	Attractive
	Problem solving	When the customer to much for waiting checkout, the staff open the checkout counters immediately to reduce my waiting time.	36.89	53.66	1.52	6.71	0.00	1.22	One-dimensional
		Returned of goods without any restrictions.	40.85	24.09	4.57	26.83	0.91	2.74	Attractive
		When goods found defective, the staff handled well.	45.73	41.77	3.05	8.84	0.00	0.61	Attractive
		If the goods are out of stock, the staff will instructions completely and follow-up treatment.	53.96	21.04	3.66	19.82	0.00	1.52	Attractive
		After purchasing the goods, the problem occurs, the staff handled well.	49.70	34.45	0.91	14.33	0.00	0.61	Attractive
		When I have question to the purchasing goods, the staff have sufficient expertise to respond to my question.	60.37	21.95	2.13	14.94	0.00	0.61	Attractive

## Proposed Improvements

### ***Department Responsibility-QFD***

Addressing the attractive and must-be quality items of the two-dimensional quality model, this study uses QFD for the conversion, classifies customer demands from investigation and converts those demands into supermarket departmental responsibilities (Table 3). The horizontal fields represent the supermarket department dimensions, each of which include sub-dimensions detailing each business function; meanwhile, the vertical fields represent attractive and essential quality items that the questionnaire identifies as requiring improvement.

This study uses satisfaction increment index (SII) as the weight of customer demand. The degrees of correlation matrix are determined by the subcommittee members during the discussion and assessment, and are used to calculate each service weight, and measure the importance of individual department functions or responsibilities. The supermarket business functions include four dimensions and 12 items, as follows:

#### ***1) Commodity***

- Commodity purchase: Purchase goods that customers need.
- Quality control: Process and inspect goods from purchase until they reach the store shelves to ensure the provision of high quality products to customers.

#### ***2) Staff***

- Professional competence: The execution of problem-solving for staff, including products, store location, and inventory information.
- Staff attitude: The attitude and performance of staff when interacting with customers and responding to questions.
- Job training: Daily staff training to increase staff work skills and familiarize staff with new processes.

#### ***3) Management***

- Store function: The supermarket not only supplies basic services but also develops its own business model continuously implements that model.
- Response capability: The standard business

process designed by supermarkets to solve unexpected problems, such as the return and exchange of goods, and requests for information on goods.

- Promotion activities: The relative activities proposed to increase the likelihood of products being sold.

#### ***4) Facility***

- Decoration: To achieve consistency in the design of the interior store space and the external color of chain stores.
- Environment: Performing cleaning of public areas.
- Accessory equipment: Accessory equipment for different storefront locations to offer customers a comfortable shopping environment.
- Route design: Route planning to help customers rapidly obtain the goods they require.

### ***Action Plan Development***

After attributing the responsibilities and operations of individual departments, this study converts results into real action plans to identify priorities for improvement. Based on department responsibilities and the relevant literature, this study builds each action plan and converts both into a matrix. The horizontal field represents action plan dimensions, while the vertical fields represent items of supermarket business function. The weights are work improvement weights, and are derived from Table 1 (departmental responsibilities). The degrees of correlation matrix are determined by the subcommittee members during the discussion, and Table 4 lists the weight and improvement order of weight of the converted action plan. The action plans comprise four dimensions and 14 items, as follows:

#### ***1) Supplier***

Reducing purchase price, increasing diversity of goods, and controlling product quality maintenance and improvement. The action plans include reducing purchase price, increasing diversity of goods, and upgrading quality of goods.

#### ***2) Personnel***

Besides constructing a knowledge management system with supplementary tools, the supermarket

TABLE 3 DEPARTMENT RESPONSIBILITIES DEPLOYMENT

Table 4 ACTION PLAN DEPLOYMENT

		Supplier				Personnel				System				Store		
		Updating and adding equipments		Enhancing convenience by display		Improving promotional activities		Improving service processes		Establishing work norms		Establishing responsibility system		Enhancing convenience to achieve store		
Degree of correlation matrix:		◎: Strong correlation	○: Median correlation	△: Low correlation												
modity	Commodity purchase	120.06	◎	○	○					△				△		
	Quality control	59.91	△	△	○					△	○	○				
Staff	Job training	134.85			△	○		○	△	○	○	○	△			
	Staff attitude	115.42			○			○	○	○	○	△	○			
	Professional competence	127.46			○	○		○	○	○	○	△	○			
Management	Store function	170.90	△	○	○								△	△	○	
	Response capability	213.83			○	○		○	○	○	○	△	△	○		
	Promotional activities	54.01		△					△					○		
Facility	Decoration	18.58												○		
	Accessory equipment	63.81											○	○		
	Environment	58.82							△	△	○		△	△		
	Route design	53.85											○	○		
	Quality technique weights		1311.31	1707.12	2132.41	3552.78	2297.46	3232.01	3773.34	1666.05	2026.56	3552.78	777.04	961.60	794.71	1729.55
	Service technique importance			11	9	6	2	5	4	1	10	7	2	14	12	8

can establish and implement a performance system. Action plans include constructing a knowledge management system, providing supplementary tools, and establishing a performance system.

### 3) System

Holding routine department meetings, designing processes for service improvement, and establishing work norms. The action plans include holding routine department meetings, improving service processes, establishing a responsibility system work norms.

### 4) Store

Improving promotional activities, updating and adding equipment, and enhancing convenience through improving displays etc.. The action plans include improving promotional activities, updating and adding equipment, enhancing convenience by display, and enhancing convenience to achieve store.

According to the convert conclusion, the six main action plans are holding routine departmental meetings, improving the service processes, constructing a knowledge management system, establishing a performance system, providing supplementary tools, and improving quality of goods.

### Conclusions

According to the results related to quality degree of importance obtained from Kano's Two-dimensional quality questionnaires, the four main quality items related to supermarket service are: meeting one-stop shopping and various product demand, offering lower prices than other supermarkets, offering special sales or products for festivals, and good staff response to customers returning defective products.

Based on the results from responsible departments, the four dimensions consumers consider supermarkets should supply are: convenience, entity, business

strategy, and staff. Furthermore, according to the results of QFD, the top five technical requirements needing improvement are: coping ability, supermarket function, on the job training (OJT), professional competency, and procurement of goods.

Based on the results of an action plan which transformed from departments responsible to specific action plans, the top five areas requiring improvement are: holding routine department meetings, improving service processes, constructing knowledge management system, establishing performance monitoring system, and providing supplementary tools. To improve supermarket service quality, supermarkets should begin with staff training and systems. Regarding staff training, supermarkets should simplify the work content and provide tools to assist staff in their work, to minimize human-error and construct a performance system for improving work quality and motivation; regarding the system, besides offering a service process suitable for customers, supermarkets can hold regular departmental meetings to review current situation and make adjustments to allocate resources to priority areas and enhance customer shopping satisfaction.

## REFERENCES

- Aytac, A., Deniz, V. "Quality Function Deployment in Education: A Curriculum Review." *Quality & Quantity* 39(2005): 507-514.
- Büyüközkan, G., Feyzioğlu, O., Ruan, D. "Fuzzy group decision-making to multiple preference formats in quality function deployment." *Computers in Industry* 58(2007): 392-402.
- Dabholkar, P.A. "Consumer Evaluations of New Technology-Based Self-service Options: An Investigation of Alternative Models of Service Quality." *International Journal of Research in Marketing* 13(1996): 29-51.
- Ding, J.F. "Applying fuzzy quality function deployment (QFD) to identify solutions of service delivery system for port of Kaohsiung." *Quality & Quantity* 43(2009): 553-570.
- Dror, S., Sukenik, Y. "A strategic service quality framework using QFD." *Total Quality Management & Business Excellence* 22(2011): 1057-1070.
- Kano, N.N.S., Takahashi, F., Tsuji, S. "Attractive quality and must-be quality." *Journal of Japanese Society for Quality Control* 14(1984): 39-48.
- Liu, C.H. "A group decision-making method with fuzzy set theory and genetic algorithms in quality function deployment." *Quality & Quantity* 44(2010), 1175-1189.
- Parasuraman, A., Zeithaml, V.A., Berry, L.L. "SERVQUAL:A Multiple-item Scale for Measuring Consumer Perceptions of Service Quality." *Journal of Retailing* 64(1988): 12-40.
- Schvaneveldt, S.J., Takao, E., Masami, M. "Consumer Evaluation Perspectives of Service Quality: Evaluation Factors and Two-Way Model of Quality." *Total Quality Management* 2(1991): 149-161.
- Yang, C.C., Jou, Y.T., Cheng, L.Y. "Using integrated quality assessment for hotel service quality." *Quality & Quantity* 45(2011): 349-364.
- Yang, C.L., Huang, R.H., Chen, C.C.: Applying QFD into Medical Device Supplier to Acquire Orders from International Medical Device Companies. *Journal of Quality*. 13(3), 277-287 (2006).
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